

Application No. 09/818,193
Amendment Dated November 23, 2004
Reply to Office Action of November 16, 2004

Amendments to the Claims

This listing of claims will replace all prior version and listings of claims in the application:

Listing of Claims:

1. (Currently amended): A method for manufacturing a semiconductor device comprising the steps of:
forming a layer of silicon dioxide on a silicon carbide substrate to create a silicon ~~dioxide-carbide~~/silicon carbide interface with an interface trap density; and
incorporating nitrogen at the silicon dioxide/silicon carbide interface for reduction in the interface trap density,
wherein the silicon carbide substrate comprises 4H-SiC and is doped with an n-type dopant.
- 2-4. (Canceled).
5. (Previously presented): The method of Claim 1, wherein the step of forming the layer of silicon dioxide comprises the steps of:
cleaning the silicon carbide substrate; and
oxidizing the silicon carbide substrate.
6. (Previously presented): The method of Claim 5, wherein the step of cleaning the silicon carbide substrate is performed with a solution having 10% HF in weight.
7. (Previously presented): The method of Claim 5, wherein the step of oxidizing the silicon carbide substrate is performed thermally.

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8. (Original): The method of Claim 7, wherein the silicon carbide substrate is oxidized at between about 900 °C and about 1150 °C.
9. (Original): The method of Claim 1, wherein the layer of silicon dioxide is greater than about 10 Å thick.
10. (Previously presented): The method of Claim 1, wherein the nitrogen is incorporated by annealing the semiconductor device in nitric oxide or nitrous oxide.
11. (Original): The method of Claim 10, wherein the semiconductor device is annealed at between about 950 °C and about 1200 °C for between about 1 and about 4 hours.
12. (Original): The method of Claim 11, wherein the semiconductor device is annealed at about 1175 °C.
13. (Previously presented): The method of Claim 1, wherein the nitrogen is incorporated by annealing the semiconductor device is ammonia.
14. (Original): The method of Claim 13, wherein the semiconductor device is annealed at about between 950 °C and about 1200 °C for about 4 hours.
15. (Original): The method of Claim 14, wherein the semiconductor device is annealed at about between 1175 °C.
16. (Previously presented): The method of Claim 1, wherein an areal density of nitrogen at the silicon dioxide/silicon carbide interface is between about $0.5 \times 10^{14} \text{ cm}^{-2}$ and about $1 \times 10^{16} \text{ cm}^{-2}$.

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17. (Original): The method of Claim 16, wherein the areal density of nitrogen at the silicon dioxide/silicon carbide interface is between about $1 \times 10^{14} \text{ cm}^{-2}$ and about $2 \times 10^{15} \text{ cm}^{-2}$.
18. (Original): The method of Claim 1, wherein the maximum concentration of nitrogen at the silicon dioxide/silicon carbide interface is about 0.5%.
- 19-26. (Canceled).